COST *and* MANAGEMENT

VOL. XXIV FEBRUARY No. 2

EFFECTIVE COST CONTROL
By Henry C. DeWitt 51

Mr. DeWitt is on the staff of Methods Engineering Counsel of Pittsburg, as a Consultant in the problems of Industrial Management. He attended Columbia University School of Business Administration and is a member of the Society for the Advancement of Management.

AIRCRAFT MANUFACTURING COST CONTROL
by John B. Shallenberger and Dean P. Stowell 59

Mr. Shallenberger is a graduate in Engineering from Stanford University and the University of Munich, and holds a Master Degree from Harvard Graduate School of Business Administration. Mr. Shallenberger is Assistant to the President of Canadair Ltd., and is a member of the Faculty of McGill University.

Dean P. Stowell is a graduate in Engineering from the University of Washington and was for eight years in Cost Accounting and Industrial Engineering Department of Boeing Aircraft. For the past three years he has been with Canadair as Industrial Engineer.

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SOCIETY NOTES

29th ANNUAL COST AND MANAGEMENT CONFERENCE AND ANNUAL MEETING

The Ontario Society will this year be host to the 29th Annual Meeting and Cost and Management Conference of the Dominion Society, which will be held in Toronto, June 22-24, with headquarters at the King Edward Hotel. The business sessions will closely follow the pattern of other years, but greater emphasis is being given to a provocative series of technical sessions on subjects relating to the field of Cost and Management, with speakers who are eminently well qualified to speak on the topics assigned to them.

And, of course, there will be an interesting programme arranged, apart from the business and technical sessions. The Conference Committee is quite aware of the difficulty of matching such a program as was provided last year in Banff. It is very true that there is nothing like the beautiful setting of Lake Louise, the exciting drive to Mt. Norquay or the panoramic view of the Bow Valley. But the Committee will endeavour to show that Toronto and the surrounding area hold much of unusual interest that will even delight those who come from Alberta, British Columbia and the Prairies.

Details of the entire program will be released each month by the Publicity Committee, through the pages of Cost and Management.

A very capable and energetic Conference Committee has been selected, with Robert McLaughlin, R.I.A., Massey-Harris Co. Ltd., as General Chairman. Supporting Mr. McLaughlin are the following Committee Chairmen:

Technical Sessions	John H. Reid, C.A., Standard Paving Co. Ltd., Toronto
Programme	J. Grant McKnight, Shirriff's Ltd., Toronto
Finance	John E. Sutherland, Canadian Westinghouse Co. Ltd., Hamilton
Registration	Harry O. Stock, Standard Platers Ltd., Toronto

Reception	Charles Warnes, R.I.A., Canadian Kodak Co. Ltd., Toronto
Publicity	Harold L. Llewellin, R.I.A,. Aerovox Canada Ltd., Hamilton

FOR EXAMINATION CANDIDATES

We are pleased to announce that complete sets of the 1949 Uniform Examinations are now available in booklet form at a price of 50c each. These can be obtained from the Registrars of the Provincial Societies or from the office of the Dominion Society.

In the March 1949 issue of Cost and Management, there appeared an editorial entitled "Some Pre-Examination Suggestions". Many of our students were very appreciative of the helpful information which it contained, and to assist those students who do not have a copy of that issue, copies of the editorial have been made and are available on request from the office of the Dominion Society.

EXAMINATION DATES

The following are the dates set for the 1950 examinations:

Fundamentals of Cost Accounting	Monday, April 24th
Accounting I	Tuesday, April 25th
Advanced Cost Accounting (Paper I)	Wednesday, April 26th
Accounting II	Thursday, April 27th
Industrial Organization and Management	Friday, April 28th
Advanced Cost Accounting (Paper II)	Saturday, April 29th
Business Mathematics	Monday, May 1st
Industrial Legislation	Tuesday, May 2nd

Candidates are reminded that applications for writing examinations must be filed by April 1st next, accompanied by the prescribed fee.

Application forms may be obtained from the Registrars of the Provincial Societies as follows:

Alberta	Mr. F. H. Ougden, R.I.A., 1439-9th St. N.W., Calgary, Alberta.
British Columbia	Mr. C. H. Davis, R.I.A., 1734 West Broadway, Vancouver, B.C.
Manitoba	Mr. A. E. Godsmark, 611 Confederation Life Building, Winnipeg, Manitoba.

Ontario ..... Mr. J. N. Allan, R.I.A., 66 King St. E., Hamilton, Ontario.

Quebec ..... Mr. G. B. Clarke, 1201, The Royal Bank Building, Montreal, Quebec.

Saskatchewan ..... Mr. R. B. Van Iderstine, R.I.A., Regina Leader-Post, Regina, Saskatchewan.

New Members

MONTREAL CHAPTER

Glen G. Morris, Richard & B. A. Ryan Ltd.
Murray D. Calder, McDonald, Currie & Co.
Hugh B. Savage, C.A., 610 St. James St. W.
N. C. D. Mactaggart, C.A., Riddell, Stead, Graham & Hutchison.
A. C. Lawson, C.A., Montreal Locomotive Works Ltd.
A. E. Wilson, Townsend Co. Ltd.
F. Hopkins, Ronalds Co. Ltd.
J. C. McMullen, United Industries Corp.
M. D. Sabloff, Woodhouse & Co. Ltd.
G. St. Onge, R.C.A. Victor Co. Ltd.
Leo Bourdua, Wilsil Ltd.
R. W. Brims, Canada Cement Co. Ltd.

SASKATOON CHAPTER

F. D. Slingsby, 140 Avenue "F" North
E. J. Miller, Sask. Federated Co-Operatives Limited
Ronald O'Hara, Sask. Federated Co-Operatives Limited

ST. MAURICE VALLEY CHAPTER

Romeo Gariepy, Grand'mere Knitting Co. Ltd., Grand'mere
Rene Lauzon, Shawinigan Technical Institute, Shawinigan Falls

TORONTO CHAPTER

G. B. Henson, Massey-Harris Co. Ltd.
F. H. Ryan, Brigdens Limited
G. W. Harley, A.B.C. Accounting Service
J. E. Milton, International Business Machines Co. Ltd.

VANCOUVER CHAPTER

S. W. McLaren, Jr., B.C. Packers Ltd.
A. Florkow, B.C. Packers Ltd.

WINDSOR CHAPTER

E. C. Little, Canadian Industries Ltd.

NON-RESIDENT BRITISH COLUMBIA

Donald Fraser, Pacific Mills Ltd., Ocean Falls, B.C.
Norman C. Ratcliffe, Consolidated Mining & Smelting Co. Ltd., Kimberley, B.C.

Chapter Notes

CALGARY

A meeting of the Calgary Chapter of the Society of Industrial and Cost Accountants of Alberta was held in the Renfrew Club on Wednesday, January 25th, 1950, at 5.45 p.m.

The speaker of the evening was Mr. C. A. Burton, C.A., resident partner, Peat, Marwick and Mitchell, Chartered Accountants. His subject was "New Depreciation Regulations, Dominion Income Tax".

There are certain features respecting the application of these regulations that required clarification and a very interesting discussion period followed the address.

FORT WILLIAM - PORT ARTHUR

The Hi-Land Inn, Port Arthur, was host last Wednesday (January 18th, 1950) to approximately 40 members of the Fort William - Port Arthur Chapter of the Society of Industrial and Cost Accountants of Ontario, who gathered for their first meeting of 1950, to hear an address by A. V. Harris, C.A., R.I.A., of Riddell, Stead, Graham & Hutchison, Chartered Accountants, of Montreal.

Chairman C. D. Henderson presided and the guest speaker was introduced by J. J. Coghlan, who pointed out that besides his regular auditing duties, Mr. Harris was a lecturer in the accounting courses conducted by McGill University—in which position he had participated for a number of years in the setting of the examinations written by student members of the Society.

The speaker who, in order to be present, had made a special trip from Red Rock, was thanked by Mr. R. B. LeCocq for the masterly manner in which he had presented the prime aims of the Society.

HAMILTON

A well-attended meeting of the Hamilton Chapter of the Society of Industrial and Cost Accountants of Ontario was held in Dining Room "A", of the Royal Connaught Hotel, on Thursday, January 19th, 1950.

The meeting was addressed by Mr. Henry DeWitt, of the Methods Engineering Council, of Pittsburgh, Pa. Mr. DeWitt gave a very interesting address on the subject of "Effective Cost Control", emphasizing the importance of the relationship of the Cost Accountant to the other organizational levels. Special stress was placed on the need for more simplified, but complete reports to the foremen level. The talk was well illustrated with very legible charts and this fact added much to the enjoyment of the occasion. Mr. DeWitt was introduced by Herb Kellond, and a vote of thanks was expressed by Bill Sparham.

KITCHENER

An optimistic future for Canadian Business was foreseen by Irvin Erb, of Kitchener, in an address on "Industrial Insurance", at a meeting of Kitchener Chapter, held in Kitchener, Wednesday, January 18th. Mr. Erb foresaw Canada forging ahead during the next few years, and described it as "The Finest Country in the World."

Canadian raw materials more and more will play an important part of world economy, with "the United States facing depletion of oil and

minerals, big business there is looking to deposits on this side of the border. Western Canadian oil and ore deposits in Labrador are among our greatest assets," the speaker declared.

The February meeting of Kitchener Chapter will be attended by the Dominion President, while Jack Kidner, of Toronto, will be guest speaker at the March meeting. Prof. A. E. Allcutt, of the University of Toronto, will address the April meeting.

LONDON

The January meeting of London Chapter, Society of Industrial and Cost Accountants of Ontario, was held in the Y.M.C.A. Building, on Friday evening, the 26th of the month, 1950, Mr. A. S. Magee, chairman of the Chapter, presiding. Opening with a dinner meeting at 6.30 p.m., the technical session at 7.30. After necessary business and Chairman's remarks, Mr. Alex. Moorehouse then introduced the speaker of the evening, Professor James Taylor, C.A., of the School of Business Administration, University of Western Ontario. Mr. Taylor's subject: "Duties and Responsibilities of the Shareholders' Auditor", was explained very clearly, and was greatly appreciated by the members and visitors present. After a very instructive discussion period, the speaker was thanked on behalf of the Chapter by Charles Munroe.

NIAGARA

On Wednesday, January 18th, the Chapter held a monthly meeting in the Welland House, with Mr. G. L. Dirks, of the firm of Albert Ramond and Associates, New York City, as speaker. The subject of Mr. Dirks was "What is a Fair Day's Work?", and was of great interest to the large number who attended the meeting. The speaker was introduced by Jack Sewell and thanked by Ted Lewis.

OTTAWA

The monthly meeting of the Ottawa Chapter of the Society of Industrial and Cost Accountants of Ontario, was held on Thursday evening, January 19th, at the E. B. Eddy Recreation Clubhouse. The President of the Dominion body, Mr. Chas. P. Dumas, M.C.I., R.I.A., of Montreal, and his Secretary, J. N. Allan, of Hamilton, paid an official visit and addressed the meeting. Mr. W. Armstrong, Assistant Secretary of the Ontario Society, accompanied them.

SASKATOON

Our January meeting was held on Monday, January 16th, in the board room of the Dairy Pool. The meeting was addressed by Mr. Floyd Peck, manager of the Saskatoon Office of Dun & Bradstreet.

The subject under discussion was "What the Credit Man Looks for in a Financial Statement". Mr. Peck's presentation of the subject was exceptionally well prepared, of which some of the salient points led to a period of lively discussion. It is unfortunate that the extremely cold weather (45° below zero) kept a number of our members at home.

ST. MAURICE VALLEY

The St. Maurice Valley Chapter of the Society of Cost and Industrial Accountants held its annual ladies' night on Friday, January 20th, at the Cascade Inn, and was well attended.

Mr. William C. Hankinson was the guest speaker and President D. J. B. Peddie did the presentation. Mr. Hankinson gave an outline of the inception, the growth and objectives of the Canadian Broadcasting Corporation. Mr. Hankinson said that shortwave broadcasts have been possible for the last 20 years. During the war many nations resorted to shortwave broadcasts to spread their propaganda to other countries. The first aim of the international service is to spread better knowledge of Canada abroad. The broadcasts are sent out to many countries in many languages. They tell about the Canadian people, their views, their culture, their forests and their mines. The response to the broadcasts, said the speaker has been very encouraging.

MONTREAL

At the January meeting held in the Vice-Regal Suite of the Ritz-Carlton Hotel, the Chapter was particularly fortunate at that time to have as guest speaker, Mr. H. Heward Stikeman.

Mr. Stikeman, an authority on tax law, was scheduled to speak on the subject "The Position of the Chartered Accountant under the New Income Tax Act". The speaker, however, changed his subject slightly, in order to speak on the recently released regulations respecting depreciation (Capital Cost Allowance).

Mr. Stikeman confined his talk to three phases of the new Act that he thought were foremost in the minds of all accountants at the moment. They were:—

1. Depreciation, dealing particularly with clause 7 and 8 of the new Sect. 20 of Bill 176.
2. Undistributed Income Sect. 9 (6).
3. Appeals. In this connection, Mr. Stikeman pointed out the necessity of the lawyer and accountant having to work together under the new appeal set-up.

WINDSOR

Fifty members and guests attended the January meeting to hear Mr. W. J. Elliott, Manager, Cost Department, Ford Motor Co., speak on the subject "Forward Costing". Mr. Elliott described each of the factors which make up the base historical cost and then went on to show how forward cost information is developed from the historical cost.

Chairman Frank Bear announced that the combined meeting of the London, Kent County and Windsor Chapters would be held in Wallaceburg on March 16th, and it promises to be a most interesting event.

ALBERTA STUDENT RECEIVES AWARD

Bert Leys was honoured at the regular meeting of the Society of Industrial and Cost Accountants of Alberta, Lethbridge Chapter, when he was presented with a silver medal. The medal is presented yearly to the student in Alberta who obtains the highest marks in the intermediate year studies, in the course of studies sponsored by the Society of Industrial and Cost Accountants of Canada. The presentation was made by Fred Ougden, R.I.A., of Calgary.

Current Literature Digest

COST OF PRODUCING CRUDE PETROLEUM, by Albert V. Smyrk, C.P.A., The N.Y. Certified Public Accountant, December 1949.

This is a comprehensive thesis dealing with the finding, developing and producing of crude petroleum, with considerable detail being given to the description and treatment of each cost factor. To those interested in the cost of producing crude petroleum, this article will be most informative.

PRODUCTION CONTROL IN THE SERVICE OF MANAGEMENT, by John A. Aplin, A.M.I.I.A., A.I.P.M., The Cost Accountant, December 1949.

In this article the author stresses in very clear and unmistakable terms the practical limitations and scope of production control. Having satisfied the reader on these two points, he then describes the services production control should render to management in respect to sales, design, production engineering, cost accounting and direct management.

COST STRUCTURE OF ENTERPRISES AND BREAK-EVEN CHARTS, by Prof. Joel Dean, The Australian Accountant, October 1949.

In his introduction, the author states: "In recent years break-even charts have come into wide use by company executives, investment analysts, labor unions and government agencies. The purpose of this paper is to appraise the reliability and usefulness of this alarmingly popular gadget. Primary attention is given to the validity of its profit projections, but its usefulness for price determination and expense control is examined briefly as well."

This is an excellent article pointing out many of the common errors in principle in the determination of break-even points and frequent misconceptions in their interpretation. On the other hand, the author does set forth the uses to which the break-even analysis may be put for more efficient management control.

COST ANALYSIS BUDGET TO EVALUATE OPERATING ALTERNATIVES FOR OIL REFINERS, by John L. Fox, N.A.C.A. Bulletin, December 1949.

What will happen "if?" Perhaps the accountant has not been telling management all he knows—or could know—about the relative costs of alternative courses of action. The present article, related to the circumstances of petroleum refiners, develops a tool for this purpose in the flexible budget principle and offers applications in five situations.

THE EFFECT OF SET-UP TIME ON UNIT COSTS—A CASE STUDY, by Albert D. Alter, N.A.C.A. Bulletin, December 1949.

Basing his material on the conditions in a spinning room—where the frames must remain idle while full bobbins are replaced by empty ones—the author studies the effect of change in "down" or set-up time through specific examples, using data as to "doffing" time, doffing labor, and running time. Conclusions as to the more general applicability of the study are offered.

PRACTICAL EXPENSE ANALYSIS TO SERVE THE NEEDS OF HOSPITAL MANAGEMENT, by Murphy Cole, N.A.C.A. Bulletin, December 194

Noting the position of the hospital in a community and the need for information on which to set or explain charges, as well as operating needs for cost data, the author of this paper presents a compact expense allocation sheet which has proven serviceable in practice. Included in the presentation, is comment attesting to the significance of accounting to a hospital administrator.

OTHER ARTICLES OF INTEREST

Four Pointers on How to Write Good Reports to Your Client (or Your Boss)
by M. J. Boedeker, C.P.A., The Australian Accountant, November 1949.

How the Controller Can Help with Operating Problems Facing General Managers
by Ray M. Schmitz, The Controller, December 1949.

Building Goodwill with Financial Reports
by J. W. Horsey, The Canadian Chartered Accountant, December 1949.

What You Need to Know About Pensions
Factory Management and Maintenance, December 1949.

ADDRESSES OF PUBLICATIONS

The Australian Accountant, 430 Bourke Street, Melbourne, Australia.
The Canadian Chartered Accountant, 10 Adelaide St. E., Toronto, Ont.
The Controller, 1 East 42nd St., New York 17, N.Y.
The Cost Accountant, 63 Portland Place, London W. 1, England.
Factory Management and Maintenance, 330 West 42nd St., New York 18, N.Y.
N.A.C.A. Bulletin, 505 Park Avenue (fourth floor), New York 22, N.Y.
The New York C.P.A., 667 Fifth Ave., New York 22, N.Y.

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COST CONTROL
PRODUCTION CONTROL
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Effective Cost Control

What Is Needed by Management and Foremen to Make Cost Accounting Effective.

By HENRY C. DE WITT

Cost Control is very often rendered ineffective through improper preparation and presentation of cost reports. The author deals with six levels to which reports must be directed and offers some useful suggestions in the psychology of presenting these reports.

To talk about making cost accounting effective, we should first explore the structure of business organizations. This is to determine with whom we must deal. There are, under many different names, three types of institutions.

The simplest is the *Sole Proprietorship.* Here, one man owns, manages and operates the enterprise. In general, this can only be successful when the business is small enough to be encompassed by that one individual and, here, there would be little doubt as to who must be served.

The next, in point of complexity, is the *Partnership.* This permits two or more individuals, usually with complementary experiences, to combine their talents in the development of one enterprise.

The *Corporation* on the other hand, is the usual form of organization under which most industry operates. It offers many legal advantages, such as the possibility of attracting its capital from many individuals who thus share in the profits, but whose liability for losses is limited.

Its problems arise from the fact that the managers are employees and not owners. Its success lies in its ability to expand as may be necessary to carry out the enterprise.

Let me here point out that only in generality does this classification relate to size. It is readily conceivable that a specific corporation can be smaller than a specific Sole Proprietorship.

It is also possible for a Proprietorship or a Partnership to have more ramifications than a specific Corporation. However, these are exceptions. Since most business enterprises operate as a Corporation, we will think in terms of such an organization.

In the Corporation there are many levels to which the Cost Accountant must present his information.

To present this graphically, let us picture two triangles—one inverted above the other with their apexes over-lapping somewhat.

The base of the upper triangle represents the *stockholders*—the actual owners of the business. The length of this base can reflect the number of individual stockholders.

The over-lapping apexes represent the *directors* who are elected by the stockholders to direct and manage their business for them.

The lower triangle represents the employees of the corporation. At their respective level of authority is shown the "Management". (I usually enclose this word "Management" in quotation marks because it represents the, often impersonal, collective body of those who manage the enterprise.). Management consists, in descending levels, of the *officers* who have administrative control and who establish operating policies; *department heads* who interpret policy and direct the business by their broad orders; *supervisors* and *foremen* who enforce the established policies through their specific orders and at the base the *operators*—workers who carry out the specific orders in their performance of routine duties.

It is to each of these six levels that the Cost Accountant must direct his reports.

Each requires a different degree of detail and each a different presentation. The detail and the presentation must be suited to the needs and capacities of the level to which it is directed. It is obvious that no particular cost-finding system will apply to all forms of industry. Cards and forms which are admirable for one application are useless in another. The underlying principles of cost-finding are, however, universally applicable and, if the principles are clear, there seldom is any difficulty in developing cards and forms suitable to the work in hand. Therefore, we will refer to general principles only.

In general, the cost accounting system, through a series of accounts, separate from, but complementary to the financial accounting system, develop the cost of the product, and, product, as used here, may be a single operation, process, or an entire completed unit.

In their simplest form, the elements of manufacturing cost can be stated as a number of equations.

Direct Material plus Direct Labor equals Prime Cost.

Prime cost plus Indirect Manufacturing Expense equals Factory Cost.

Factory Cost plus General Expense equals Total Cost.

Total Cost plus Profit (or minus Loss) equals Selling Price.

The greatest problem of cost finding is to properly and justly distribute burden or expense over the processes or products so that each shall bear its own share and only its own share of expense.

Usually the cost accounting system has three uses:—

1. To show the actual cost of operations.
2. To serve as a basis of predicting future performances.
3. To form the basis of managerial reports.

It is this third use with which we are here concerned.

We have already noted the six levels to which these reports must be directed, and we have seen that each requires a distinction in presentation and degree of detail.

Let us look at another angle,—that is—the report must be suited to the personality of the individual receiving it. May I illustrate by a personal experience.

Some few years ago I found myself preparing, each month, for the personal use of the President of one of the largest manufacturers of electric lights, a comprehensive digest of the corporation's accounting reports—both financial and cost. This was his personal "bible", by which he managed the affairs of the corporation. It was a comprehensive series of some forty pages of reports, each five or more columns of figures, each comparing the month's operations this year against last year; the operations for the period this year against last year, and a comparison with the budget. Each Manufacturing Division and each Department of this corporation was represented by its own Balance Sheet, Profit and Loss Statement and Summary operating report. All in all, the report represented an accountant's dream.

This President was a gentleman who thoroughly understood and comprehended these columns of figures.

But—he died!

The new President, a younger man with an entirely different education and background, looked at these columns of figures and shuddered. They just did not register. However, when we got to understand each other, he wanted the same in-

formation, but for him it must be all shown in charts or graphs. Only in that manner was he able to understand them.

The obvious point of this story is, if we expect the recipient of our reports to use them, they must be presented in such a manner that he can comprehend them, and this applies, whether the report is intended for the Owners, the President, or one of the Foremen.

If the individual to whom it is directed does not understand it, you might better have used your time to go fishing or played golf.

Now, let us consider the reports and how to present them so that they are most effective.

In a textbook on Cost Accounting, published in 1916, I find this statement:—

"Workmen are not, in general, interested in cost finding methods; Foremen are often antagonistic, and even the Superintendent may be apathetic."

How time and people have changed!

Where, to-day, do you find a Superintendent who is not eager for accurate costs or a foreman who is not anxious for the guidance that comes from proper cost accounting? The enlightened workman knows the importance of costs, and that, only in those organizations where costs are known and controlled, is there JOB SECURITY.

The statement has repeatedly been made, that 80% of the blame for non-production lies with the Management, meaning that only 20% of the fault can in any way be attributed to the workers. This failure, on the part of the Management, extends into many branches of the industrial organization, covering not only failure to provide the means of actually producing the goods, including all manner of devices and equipment for facilitating the movement of goods, but also the failure to furnish the foreman and his assistants with the proper backing in the matter of records showing what they are accomplishing.

Probably in a great majority of manufacturing plants today, figures by the thousand are compiled and safely salted away in files where no one makes sufficient use of them to warrant their compilation. This is one of the most fatal mistakes that can be made.

The thought is advanced that such figures are confidential; that they might leak to someone outside of the plant and enable

a competitor to learn something about the business. As an actual fact, the figures of various expenses of a department are peculiar to that business alone. Even if known outside, the chances are very slim of their being of any particular use. Even within one industry, the internal workings of individual concerns are so different that figures pertaining to any one department are absolutely worthless to an outsider. The conclusion seems clear that withholding from operating foremen the figures which would mean so much to them if available in comprehensive and useable form, is plain failure on the part of the Management. How would you enjoy a game of baseball without any score being kept? Just try to imagine a big league game without any score board. It would be a dull game indeed. Cost and production accounting furnishes the score to those who are playing a game—a game far more vital than either baseball or football, in which are tied up ambitions, hopes and loyal work.

The foremen and the workmen want to know the score. It is up to the Cost Accountant to tell them what the score is. But it must be told so they will understand it—so they can use and apply it.

The Department Head, whether you call him an operating superintendent or a foreman, requires at least three statements or sets of figures to inform him how he is doing.

He requires:—

1. A comparative burden report covering all indirect expenses charged to his department or cost center.
2. A statement of direct labor costs.
3. A statement of direct material costs.

The value of the Burden Report lies in making possible a comparison of present and past.

Its form should be simple. As shown on the chart (see p. 55) the first two columns provide for account or standing order numbers and the name of the account. The third column carries the average unit rate for the previous period. The next columns (group), repeated across the page, provide a set of columns for each month: These show for each standing order the amount of money and the unit rate for the month and the average unit rate from the beginning of the present period.

Such a report gives the Department Head an opportunity to watch the expenses charged his department of cost center. Never lose sight of the fact that any expense or burden account

is made up of small items. Constant vigilance in keeping down the expenditure of every one of them, will decrease the burden cost of the business to an extent that will be surprising. The fund of information that can be furnished the Foreman on Direct Costs—either Labor or Materials, depends upon the kind and degree of control that is used in running the plant.

When a method of production control is followed, and the various direct operations are carefully scheduled at standard materials and rates, the natural way of controlling the direct operations is to keep in constant touch with performance, as shown by the *variance* from standard.

Cost of material entering into a given article can, in most cases, be ascertained in advance. Bills of materials can be made out, material can be measured, weighed or counted and the value entering into a given part can be recorded with sufficient accuracy.

Labor costs, however, often present a somewhat different problem. The amount and value of the material going into a given part will, in general, be fairly constant, but the labor value may vary within wide limits if means are not taken to prevent such variation.

COMPARISON OF MONTHLY BURDENS

Department .....

Burden Figured Per .....

For Period Ending .....

Standing Order Numbers	Account	Average For Previous Period	Name of Month		
			For Month		Unit Rate Average
			Amount	Unit Rate	
			Repeat for Each Month		

The unit rate is the thing to watch and cut down.

Burden eats us up and must be watched all the time.

Labor is often the largest item entering into factory costs and since also, direct labor is often used as a means of measuring the factory expense which belongs to each part, it is obvious that labor costs should be accurately determined if possible.

To the manufacturer pressed by competition, there are, apparently, only two ways of reducing costs. One is by reducing wages, the other is by developing better methods.

Low wages do not mean low costs, since labor is generally not such a closely definable quantity as is material. It is, therefore, highly important that careful records be kept which will inform the Management of the labor costs of all operations performed.

I have been able to say something pretty definite about how to give the foremen information on:—

Indirect Expenses or Burden and Direct Material Costs.
Even something about Direct Labor Costs.

Under almost all methods of production control, Direct Material required is carefully determined by product specifications, materials lists, part lists, or manufacturing information, and the efficiency of use can be determined by comparing actual consumption with theoretical requirements.

There remains the necessity for supplying the Foreman with some means of determining whether or not he is receiving value for his direct labor expense—a fair day's work for a fair day's pay.

DON'T just send accounting statements to the Foreman and expect him to be able to use them. He is NOT an Accountant, and he IS NOT a COST ACCOUNTANT.

Accounting statements may look very nice to you, Mr. Cost Accountant. They may tell you quite a story, but to the Foreman, they are just something sent down by the office boys, that either land in the bottom drawer or in the waste basket.

Last month, I discussed this very problem with a Foreman in one of the big steel plants in Pittsburgh. He told me (and I quote him):—

> "Cost sheets come down each month, giving the cost of the product and the only one who could understand it was the man who made the cost sheet. 'Way over the foreman's head and hence filed with everything else that is not understood—in the wastebasket."

Now—how do we get our story over to the Foreman? By education. The panel discussion is the best means of passing on the information to the Foreman.

Such discussions around the conference table—man to man—can be the means of raising the Foreman from a LABOR BOSS to his true present-day status—an executive—the company representative to the man who does the work. Then too, the Foreman will better understand your figures if they present a clear comparison; if they clearly indicate the trend; especially if they show the picture graphically. Throw your hands up in horror if you like, but the Foreman does require some information that he can pass on to the workmen. If you don't give him facts he will deal in fiction. Remember, the men working for him want to know the score. They will be more interested in their jobs, and make the foreman's job easier if they are supplied with vital information in a manner that is understandable to them.

To tell the steel mill worker that this or that material fed into the open hearth furnace is worth so much a ton, means nothing to him. But to illustrate that a shovel full of manganese costs $7.50, while a shovel full of silicate is worth about eight cents, drives the point home. For this same workman to know that an open hearth furnace is a million-dollar piece of equipment is beyond his comprehension, but he can understand that it costs $1.00 per minute to operate it.

In this steel plant when the workmen draw a "poor heat of steel" it cools in the ladle leaving a "skull", which is a ring or coating an inch to an inch and a half thick on the inside of the ladle, and that ladle is put out of commission until it is relined.

That meant nothing to the workmen until they learned that it cost their department $300 to put that ladle back into operation, and that the $300 expense has some effect on their earnings. Realization of what it cost them as individuals soon taught them to be careful to bring the "heat" to the proper temperature before drawing the furnace.

The only person who can furnish such information is the Cost Accountant. Buried in statistical reports, such information can accomplish nothing; enlivened and presented in a manner that can be understood by the workmen, it has an opportunity of realizing worth-while savings.

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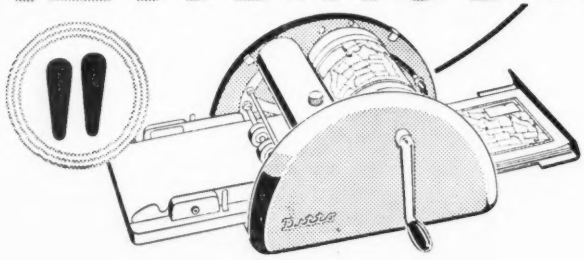

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Aircraft Manufacturing Cost Control

By MESSRS. JOHN B. SHALLENBERGER and DEAN P. STOWELL

This article is divided into two parts. The first presented by Mr. Shallenberger, provides a brief outline of the more complex problems connected with aircraft production, and the second, presented by Mr. Stowell, deals with the problem of cost control. Under the latter, specific attention is given to the application of the learning curve to the first unit estimate in order to determine the cost of successive units. He also deals most effectively with the problem of setting up procedures by which to assure that estimates will be met.

The modern airplane is an intricate mechanism. A far cry from the sticks and wire that amazed the world in 1903 with gravity-defying feats, the modern airplane may be found equally amazing to the present-day observer who stops to consider the problems involved in designing, producing, and assembling thousands of pieces of aluminum and steel in such a way that they will fly in the air.

In addition to all the standard enigmas of industrial production, the aircraft manufacturer must have a healthy respect for two factors which immediately and completely subordinate every other consideration. *Safety* and *weight* are fundamental guideposts in aircraft production. They are absolute by-words in the production of commercial transports.

Initially, the problem of the designer, weight is the key to air transportation economics. The transport airplane's mission is to carry itself and, in addition, a payload of passengers, freight, mail, or other cargo. Since the total weight of aircraft and payload is fixed by such things as the aircraft's power and aerodynamic efficiency, every pound saved in aircraft structure is a pound gained in payload—a pound that is, which can be sold for revenue. If the designer, by careful stress analysis and by selection of proper materials, and the manufacturer, by careful attention to tolerances and abhorrence of unnecessary weight "growth" in production, can save a few pounds of aircraft weight, the aircraft will be capable of carrying a few pounds more payload profitably throughout its useful life.

Weight saving in modern aircraft is accomplished largely by using light-weight materials and by limiting the amount of

material to that which is absolutely necessary to supply the required structural strength. As you know, aluminum alloys have been found desirable for this purpose because of their low weight for a given strength. In order to provide the structural strength required with the minimum amount of material, designers have resorted also to monocoque construction. This is a means of using the shell of a structure to provide much of its strength, thus reducing the need for heavy beams and structural supports. An egg is an example of monocoque construction. The strength of the egg lies in its own covering, the shell, and there is no internal structure. An airplane's strength likewise, lies largely in the strength of the skin which covers it.

Any one portion of the airplane skin, like the broken shell of an egg, has little strength in itself. The airplane structure is thus relatively weak during the manufacturing process and often will not support even itself until linked together with the coterie of adjoining members.

The manufacturing problems arising from the use of somewhat flexible light materials and adherence to the monocoque structural design are manifest. The structural members, having insufficient strength until their assembly, must be held together by supporting devices known as jigs. The material, being light and malleable, is often undependable from a standpoint of dimensions and presents difficult problems of standardization and interchangeability. Two similar parts that have gone through the same forming or riveting process may come out with different dimensions; one may fit and the other may not.

Light-weight materials and monocoque construction are only two of the aircraft manufacturer's major problems. Another is the problem of quality control. Lives are at stake when the aircraft enters service. The aircraft designer, the aircraft manufacturer, and the airline operator must achieve constant and absolute mechanical perfection. Anything short of perfection cannot be tolerated.

The normal practice is to inspect every part after each major manufacturing operation to which it has been subjected, partly in order to determine its quality and partly in order to assure that parts which would later be rejected do not become involved in further costly processing. The rejection rate is high and the inspection costs are huge, but every expenditure incurred to ensure the safety of the finished product is well spent.

But light-weight materials, huge numbers of parts, and exacting quality control are still only a few of the problems confronting the aircraft manufacturer. Even the familiar problems of machining steel are found to be extraordinarily exacting in aircraft construction. Fusion welding, so simple a process for many industries, becomes doubly difficult when 100% perfection is the goal. Metal forming, ordinarily a matter of bending sheets of material over simple dies, becomes doubly complicated because of the necessity for heating either the material or the die itself to precision temperature levels.

Production control methods used by the aircraft manufacturer, aside from the peculiar demands of aircraft construction, follow somewhat standard factory patterns, on perhaps a more elaborate scale because of the excessive number of parts that must be planned, scheduled, produced, and traced through the factory.

A given airplane may be said to be produced with a flow time of six months. This means that six months pass from the time the first piece of aluminum alloy is cut from the sheet to the first flight of the finished airplane. During this period for the Canadair Four, some 100,000 separate parts must pass through the various stages, and must reach the proper sub-assembly departments at their allotted times. Sub-assemblies, in turn, must find their way to the major assembly areas, where they will be joined with other sub-assemblies and form perhaps a wing or a tail unit. These major assemblies must ultimately reach the final assembly line for installation on the fuselage, and the final assembly line must move forward on the prescribed date, in order that the finished aircraft may be available as required by the *delivery* schedule.

While a single part may spend six months moving through the various functional departments of the shop, once the first aircraft has been completed, others will follow in close order; and as the entire factory becomes oriented to the jobs at hand, the rate of production increases.

Planning aircraft production is a matter of forecasting, from experience and known production standards, the time it will take to produce each part and to perform each assembly and installation operation. The planner works back from the finished airplane to determine the date on which each part or assembly must be ready for the next production stage. The result is a flow

chart on which all scheduling is based. The flow chart specifies the delivery date of the finished airplane, the date on which the wing must be assembled with the fuselage, the date on which the spars must be ready for assembly into the wing, and ultimately, the dates on which the spar caps must be milled and the dates on which the spar cap forgings must reach the factory from the supplier's mill.

These production methods become second nature to aircraft manufacturers and are not so formidable as they may appear. The production engineer in an aircraft plant comes to manoeuvre one hundred thousand components with the same facility as his colleague in the automobile industry, whose product may have only four thousand instead of a hundred thousand parts, or the manufacturer of a bus, with perhaps six thousand parts, or of the ocean liner, with perhaps sixty thousand parts. The production inspector, constantly mindful that safety is the supreme goal, develops absolute intolerance for anything short of perfection.

Subordinated always to the safety factor, but of great importance to those for whom aircraft manufacture is a source of jobs and revenue, is the problem of aircraft costs. The peculiarities of aircraft design and safety requirements which complicate the job of the manufacturer, present similar perplexities to the aircraft industrial engineer. Trying to attain cost standards in the face of unstable dimensions, unpredictable rejection rates, and frequently undependable empirical data, is the problem of the industrial engineer.

Management dumps into the laps of the cost accountants and the industrial engineers reams of blueprints—it takes about 8,000 drawings to manufacture a Canadair Four, exclusive of engines—and management asks how much the aircraft will cost, how many labour hours each part will require, how much time must be allowed for sub-assembly, how many pilots will be required for flight testing, how much cash will be needed and when, how much material must be bought, and so forth.

Dean P. Stowell, Industrial Engineer at Canadair, has for many years been burdened with the task of answering these questions. Mr. Stowell will show how he and his staff, in collaboration with the accounting and other departments, forecast, budget, and control aircraft costs.

AIRCRAFT MANUFACTURING COST CONTROL

Industrial engineering in aircraft manufacture is a specialized field of cost accounting. Its basic aim, cost control, embraces elements common to most control systems. First, there is the determination of an objective—what is to be accomplished. Secondly, there is the procedure of specifying how, when, and by whom the plan is to be executed; and, thirdly, there must be means of appraisal by Management to tell how well the job is being done.

To-night, I will confine most of my comments to the subject of direct labor control which comprises by far the biggest share of controllable manufacturing costs.

The starting point in determining an objective is to visualize as well as possible what it will cost in labor hours to build some one specific aircraft within any series. Some operators prefer to visualize this as an aircraft being built after production is well under way, say the twentieth, fortieth or possibly the hundredth aircraft. Others, however, prefer to determine estimated costs on the first aircraft of any given contract. This is a matter of opinion; the end result attained is the same in either case. A study is made of the hour per pound rates attained in the industry and also within the company as a means of determining what constitutes good production performance for the type of aircraft being considered.

Different models of a specific type of aircraft exhibit remarkably uniform cost per pound of airframe under comparable manufacturing conditions; however, there is a wide divergence among the various aircraft types as to cost per pound. A small, high performance or military aircraft has usually a higher cost per pound than a large utility or commercial transport type.

The approximate cost rate having been determined, the aircraft is then reviewed in detail as to engineering design, the quantity being produced, and any special considerations such as flight testing program, installation of special equipment, and the relative amount of company experience on similar models. As to design, it is necessary to keep in mind that high performance structure greatly influences cost; thus the trend towards jet-propelled high speed aircraft is a trend towards revised cost standards. Also, fighter type aircraft, with their high concentration of equipment in small congested areas, tend to produce their own peculiar cost problems.

The quantity produced establishes the engineering and tooling programs to be adopted. Small quantity production means less production engineering. As a result, the aircraft is built in larger sections with resultant effects on manufacturing costs. On small run contracts detail tooling is confined to the low production type and hand work is high. The larger the contract the more use is made of high production methods of parts fabrication and assembly techniques; in any case, cost of tooling is balanced against the cost of manufacture until a reasonable compromise point is reached.

On new models, and often on old, flight and research programs must be anticipated. This requires special instrumentation and excessive flight time and involves a considerable cost. One must, in addition, be on the lookout for special new types of equipment to be installed in the aircraft and their resultant effects on manufacturing time.

Assuming now a reasonable estimate of man-hours for our No. 1 aircraft unit has been determined and reviewed against the type of aircraft, the quantity and other special factors, the next step is one of the most interesting phases of cost projection work, the application of the learning curve.

As we build each successive unit in any given series, the unit labor expenditure will be reduced at a somewhat uniform rate, a rate which we plot as a learning curve.

There are many different learning curves, but the most widely used and quoted in the aircraft industry is the 80% curve; many of you have probably come in contact with it. Experience shows us that when the production quantity is doubled the cumulative unit average cost is 80% of the unit average cost of the quantity doubled. In other words, there is a saving of 20% every time production quantities double.

A peculiarity of the aircraft learning curve is the rapid decrease in cost for the early stages of production. Unless this were adequately taken into account, large errors in costing and shop loading would result.

A problem of the industrial engineer is how to apply the learning curve to the No. 1 aircraft estimate in order to determine the cost of successive units. The biggest factors affecting the application of an experience curve are the required rates of production and acceleration.

If airplane deliveries are required rapidly and at a high rate per month or week, much multiple tooling will be required in assembly operations. This means that several crews of men will be required to do the work with the result that no one crew will gain as much experience as if the program could have been built with the use of a single crew. Thus the experience and learning to be gained from any given contract is less, and the anticipated learning curve would not be steep. Another consideration is the No. 1 aircraft man-hours on a particular type of aircraft; if high initial hours are contemplated, the chance for improvement is large; therefore, a much steeper learning curve can be anticipated.

If this model of aircraft has been built before or if very similar aircraft has been built on previous contracts, the industrial engineer asks himself: "What are the chances of bringing previous crews back on similar work. How much know-how or experience can be counted on to carry over to the new project?"

If a good deal of know-how can be carried over, the No. 1 aircraft should cost less, but, at the same time there is less potential saving, and the learning curve will not be so steep.

The next step in cost *control* is a matter of setting up procedures by which to assure that contract estimates will be met. To do this effectively the total labor expenditure is broken down into three groups as illustrated by this chart; the large block is called unit time, the other two blocks are sub-assembly and fabrication time. Each of these blocks represents a different area of the manufacturing plant and essentially different types of work; thus the means of control vary. Unit items are sections of the aircraft large enough to be controlled by units. Time is charged directly to each successive unit as it is being built and as these times accumulate they are compared with the budget man-hours for that unit. This is done on a daily basis.

Sub-assembly groups are budgeted on a departmental basis rather than on a unit basis, and an accumulated daily record of hours spent against the budget is maintained as well as the daily progress schedule.

In the fabrication area a departmental, by-machine-group, daily accumulation is maintained. In addition, the daily accumulated parts completed by machine group are recorded; thus the average cost per piece by machine group, actual and budgeted, is obtained.

To ensure an accurate accumulation of this data, cost center bulletins are issued to timekeepers in manufacturing departments, outlining in detail the series of labor codes to be applied. These are administered by liaison men from cost departments.

As the program progresses and tools, materials and parts become stabilized, methods people are employed to work out proper sequences of assembly and installation for unit time items. This work is done in co-operation with the manufacturing and production departments; as each work station is loaded in sequence in this manner a daily report is instituted showing actual accomplishment against budget.

As a further means of control, man-power loading curves are issued, both on the total employment and departmental employment. These indicate by week the number of men required in each department to maintain production schedules. It is the responsibility of the Manufacturing Division, through the Personnel Office, to maintain employment at these indicated levels. The result, in actual man-hours obtained from this control, is directly related to how well management enforces the use of the man power data provided.

The final step in cost control is one of appraisal by Management. In order to make this appraisal possible, a series of reports, charts and comparisons are prepared and distributed. For the Shop Supervision in the unit time area there are so-called Record-to-Beat sheets. These are daily records of the hours expended on each unit, showing both the daily and accumulated hours as well as the budget hours. These are used primarily by Shop Supervision to control their effort.

For still other purposes, Log-log charts are prepared on each unit time item and on the program as a whole. These are merely a reflection of the learning curve projections for each individual unit item. The actual hours are posted against the budget curve as each unit is completed.

Management is kept advised daily of the actual man-hours expended and the man-power employed by department. These are shown against budgeted figures. Finally, a summary report is prepared, showing the entire factory periodic and accumulated expenditure of hours. Once weekly, Management receives a report which shows a percentage of realization of actual man-hours compared to estimated man-hours for the entire operation. At a glance the production performance is evident.

« STUDENT SECTION »

GENERAL ACCOUNTING COMMENTS

By J. D. CAMPBELL, C.A., R.I.A.

ACCOUNTING II

QUESTION 4 (30 marks)

A trial balance of A. B. Company Limited, a company incorporated under the Dominion Companies' Act, is shown hereunder:—

TRIAL BALANCE
As at December 31st, 1948

	Dr.	Cr.
Advertising Expense	$ 28,553	
Accounts Receivable	210,185	
Accounts Payable		$ 38,796
Bonds—Dominion of Canada—at cost	100,000	
Bond interest received		2,500
Cash in Bank	23,350	
Cash Discounts on purchases		4,271
Cash Discounts on sales	2,785	
Inventories, 1st January, 1948:—		
Raw Materials	49,754	
Work in process	25,366	
Finished Goods	187,523	
Inward Freight and Cartage	8,271	
Sales returns and allowances	11,372	
Fire Insurance—factory	2,758	
Factory Building	100,000	
Machinery and equipment	368,780	
Land	50,000	
Executive salaries	28,546	
Packing and shipping expenses	8,371	
Outward Freight	472	
Labor—direct	278,496	
Labor—indirect	57,112	
Property taxes—factory	1,452	
Miscellaneous factory expenses	9,743	
Light, heat and power—factory	15,863	
Repairs and maintenance—factory	18,765	
Factory supplies	9,514	
Reserve for depreciation of buildings		22,500
Reserve for depreciation of Machinery		114,786
Reserve for depreciation of delivery trucks		4,250
Reserve for depreciation of office furniture and fixtures		6,175
Miscellaneous selling expenses	9,175	
Office salaries	12,561	

Office stationery and supplies	$ 923	
Postage and excise stamps	1,561	
Audit fees	1,250	
Office furniture and fixtures	12,250	
Purchases—raw materials	310,843	
Purchases—finished goods	27,357	
Salesmen's salaries	15,785	
Salesmen's expenses	7,213	
Rent of office premises	1,500	
Miscellaneous office expenses	2,861	
Reserve for doubtful accounts receivable		$ 10,518
Sales		1,053,911
Capital Stock—authorized and issued: —		
500,000 shares of $1 each		500,000
Surplus		287,513
Instalments paid on income taxes	35,000	
Delivery trucks	10,000	
	$2,045,220	$2,045,220

The following information is also furnished:—

The company's year end is 31st December.

On 31st December, 1948, goods ready for shipment with a sales value of $2,461 had not been included in sales or inventories.

Raw materials received on 31st December, 1948, were included in inventories but the relative vendors' invoices aggregating $1,246 were not entered in books.

Accrued wages at 31st December, 1948, direct $8,657, indirect $1,459.

Quoted market value of Dominion of Canada Bonds at 31st December, 1948, $101,000.

Accrued bond interest on these bonds, $500, is not entered on the books.

At 31st December, 1948, advertising supplies on hand were valued at $1,675, prepaid fire insurance amounted to $286, accrued property taxes were estimated at $423, factory supplies on hand were valued at $1,250.

Inventories on hand 31st December, 1948, as determined by physical count and valued at the lower of cost or market were as follows: Raw materials $42,687, work in process $38,947, finished goods $206,571.

The fixed assets are carried on the books at cost; provision is to be made for depreciation at the following rates applied to the closing gross book values of the assets: Building 2½%, machinery 10%, delivery trucks 20%, office furniture and fixtures 10%.

On the 15th December, 1948, a dividend of 10c a share was declared by the directors, payable 2nd January, 1949.

A provision for income taxes is to be made in the amount of $55,608.

The reserve for doubtful accounts receivable is to be increased by an amount equivalent to 1/10 of 1% of the net sales for the year.

Required:

Prepare balance sheet, manufacturing and profit and loss statement of the Company for the year ending December 31st, 1948.

Solution:

A. B. COMPANY LIMITED

Statement of Cost of Goods Manufactured

for the year ending 31st December, 1948

Work in process 1st January, 1948			$ 25,366
Add:—			
Cost of raw materials used			
Inventory 1st January, 1948	$ 49,754		
Purchases of raw materials	312,089		
Inward freight and cartage	8,271		
	370,114		
Less: Inventory 31st December, 1948	42,687	$ 327,427	
Direct labour		287,153	
Factory service (overhead)			
Indirect labour	58,571		
Fire insurance	2,472		
Factory supplies	8,264		
Depreciation—factory building	2,500		
—machinery and equipment	36,878		
Property taxes factory	1,875		
Light, heat and power	15,863		
Repairs and maintenance	18,765		
Miscellaneous	9,743	154,931	769,511
			$ 794,877
Less: Work in process 31st December, 1948			38,947
Cost of goods manufactured			$ 755,930

A. B. COMPANY LIMITED

Operating Statement for the Year Ending

December 31st, 1948.

Gross Sales	$1,056,372	
Less: Sales returns and allowances	11,372	
Net Sales		$1,045,000
Cost of goods sold		
Finished goods inventory, January 1, 1948	$ 187,523	
Add: Purchases, finished goods	27,357	

COST AND MANAGEMENT

Cost of goods manufactured, year to date		$ 755,930	
		970,810	
Less: Inventory of finished goods December 31, 1948		206,571	$ 764,239
Gross Trading margin			$ 280,761
Selling and Administrative Expenses			
Selling and Delivery Expenses:—			
Advertising	$ 26,878		
Salesmen's salaries	15,785		
Salesmen's expenses	7,213		
Packing and shipping expenses	8,371		
Outward freight	472		
Miscellaneous selling expenses	9,175		
Miscellaneous selling expenses	9,175		
Depreciation of delivery trucks	2,000	$ 69,894	
Administrative and General Expenses:—			
Bad debt expense	$ 1,045		
Depreciation of office furniture and fixtures	1,225		
Executive salaries	28,456		
Office salaries	12,561		
Office stationery and supplies	923		
Postage and excise stamps	1,561		
Audit fees	1,250		
Rent of office premises	1,500		
Miscellaneous office expenses	2,861	$ 51,382	
Total trading expenses			$ 121,276
Net trading margin			$ 159,485
Add other income:—			
Cash discounts on purchases		$ 4,271	
Bond interest received		3,000	
		$ 7,271	
Less: Financial expenses			
Cash discounts on sales		2,785	4,486
Net profit before provision for income taxes			$ 163,971
Provision for income taxes			55,608
Net profit for the year, transferred to earned surplus			$ 108,363

STUDENT SECTION

A. B. COMPANY LIMITED
Statement of Earned Surplus for the
Year Ending December 31, 1948.

Earned Surplus balance J,anuary 1, 1948	$ 287,513
Add: Profits, year to date	108,363
	$ 395,876
Les:: Dividend declared and payable January 2, 1949	50,000
Earned surplus balance December 31, 1948	$ 345,876

A. B. COMPANY LIMITED
Balance Sheet as at December 31, 1948.

Assets

Current Assets:—			
Cash in bank		$ 23,350	
Accounts Receivable	$ 212,646		
Less: Provision for bad debts	11,563	201,083	
Inventories: (Valued at lower of cost or market)			
Raw materials	42,687		
Work in process	38,947		
Finished goods	206,571	288,205	
Deferred Charges to expense			
Advertising supplies	1,675		
Prepaid insurance	286		
Factory supplies	1,250	3,211	
Dominion of Canada Bonds—at cost	100,000		
Accrued Interest on Bonds	500	100,500	$ 616,349
(Market value as at December 31, 1948, $101,000)			
Fixed Assets: (at cost)			
Land		$ 50,000	
Factory Building	$ 100,000		
Less Reserve for depreciation	25,000	75,000	
Machinery and equipment	368,780		
Less Reserve for depreciation	151,664	217,116	
Delivery trucks	10,000		
Less Reserve for depreciation	6,250	3,750	
Office Furniture and fixtures	12,250		
Less Reserve for depreciation	7,400	4,850	350,716
			$ 967,065

Liabilities and Capital

Current Liabilities:—		
Accounts Payable	$ 40,042	
Accrued Wages Payable	10,116	
Accrued Taxes Payable	423	
Reserve for Taxes	20,608	
Dividend Payable	50,000	$ 121,189
Capital and Surplus:—		
Capital stock—Authorized and issued 500,000 shares of $1.00 each	$ 500,000	
Earned Surplus (as per statement)	345,876	845,876
		$ 967,065

Comments:

The errors which arose in the answer to this question were numerous, and might be classified as mechanical errors, errors in classification and form and errors of principle.

Under the first classification were included the usual errors in addition, subtraction, misplaced decimal points as well as errors in calculation as to the amounts of depreciation and bad debt expense.

The second group, as to errors in classification, included such examples as items of general operating or administrative expense classified as manufacturing expense; treatment of the provision for income tax as a surplus item; the treatment of the prepayments of income tax as an operating expense. In general, the form of the statements was good, but in many cases bases of valuation were not indicated and the classification might be considered too general.

The following list of errors taken from a representative set of papers will serve to illustrate the above outlined errors coupled with the errors in principle referred to:—

1. Accrued property taxes treated as prepaid property taxes.
2. Prepaid advertising disregarded.
3. Misinterpretation of basis of computation of depreciation.
4. Taxes paid in advance treated as an expense in addition to total provision.
5. Failure to adjust for goods received (in the cost of raw material used) which had not yet been entered on the books.
6. Dividends treated as an operating expense in the determination of net profit.
7. Prepaid fire insurance treated as an accrual.
8. Bond interest received treated as an expense.
9. Sales returns added to gross sales to obtain net sales.
10. Misinterpretation as to the meaning of the terms net sales re provision for bad debts.

It is difficult in a question of this nature to present constructive comments which are specific. The failure to balance the statement presented was prevalent which arose out of mechanical errors plus a failure to carry through both aspects of the adjustments which were required.

,189

,876

,065